

## WHEEL HUB COMPONENTS INFORMATION

### Roller

The roller is one of the most important raw materials of the wheel hubs. The roller is manufactured using GCr15 steel, which is same steel as used in the inner ring. Manufacturer chooses the Z3G10 grade roller steel for the wheel hubs to ensure vibration and noise free performance.

### Cage

The nylon cage makes it possible to reduce the noise of the bearing. The glass fiber reinforced polyamide cage ensures precision performance, and keeps the rollers at the correct position of the raceway.

### Seal

NBR is the raw material used in manufacturing the seals. The multiple lip structure is designed to ensure that the sealing performance matches the requirements of different working conditions. Seal lips are pre-greased before assembly to increase operational life.

### Tone ring

The tone ring is manufactured for various wheel hubs using raw materials specific to the application. For those hubs where the tone ring is assembled in the wheel hubs, the technology of powder metallurgy is used. For those hubs where the tone ring is assembled on the outer ring, the steel of SAE1045 with dacromet or galvanized is used.

### Encoder

The encoder is an advanced design for the tone ring. Manufacturer's supplier provides the high performance encoder by using the advanced technology of scanning magnetizing. This supports full system accuracy even if the gap distance varies during operation.

### Integral ABS sensor

As the popularity increases with the wheel hubs that have ABS with an integral sensor, the performance of the ABS sensors have become very important. Two mainly integral sensors are widely used: the magnetic sensor and the Hall sensor. All of our Hall chips are bought from Freescale or Infineon to ensure consistent quality. 100% of the units are tested on line to ensure the output signal of the sensor will be read by the ECU of the vehicles.

### Studs

Manufacturer's supplier provides reliable and OE quality studs, the same studs that are supplied to NISSAN, using the SCM435 steel (35Crmo in China), which ensures the tensile strength and safety parameters.

### Grease

Chevron black pearl or Mobile EP2 is a high quality grease recommended by some OE bearing manufacturers such like SKF, NSK. The grease quantity added into the raceway of the wheel hubs is controlled automatically ensuring sufficient lubrication and provides optimum bearing performance and life by minimizing friction.

### Roll Form

This design provides additional bearing strength and prevents change of factory set preload adjustment during installation by over torquing of axle nut.



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**QUALITY AUTOMOTIVE  
COMPONENTS**

**ROLL-FORM UNIT**

**NON ROLL-FORM UNIT**

## ROLL-FORM UNIT

In order to maintain vertical spline integrity during the manufacturing process, a vertical broaching machine is used to make the splines after the roll form flange is created. This insures that the exact original equipment dimensions of the splines will be made.

The seal structure is optimized with as many as three sealing lips and one stainless steel gland.

Optimization of the seal structure is guaranteed by using four sealing lips, which improves the sealing performance and maintains abrasive resistance. Both the seals and the bearings are pre-greased before installation.

### STEEL RAW MATERIAL OF WHEEL HUBS

The standard raw material chosen by manufacturer meets or exceeds the requirements of the following OEM technical specifications:

- Outer ring – SAE1055
- Inner ring – GCr15 (SAE52100)
- Flange inner ring – SAE1055

### HEAT-TREATMENT AND HARDNESS

The outer ring and the flange inner ring are manufactured using the induction heat-treatment process, which hardens the work surface. Then the tempering manufacturing process is used, which meets or exceeds the hardness required in HRC59 ~ HRC64.

The inner ring is manufactured using the quenching process, which hardens the whole inner ring. Then the tempering manufacturing process is used, which meets or exceeds the hardness required in HRC61 ~ HRC64.

Each ABS sensor is tested during assembly, assuring the proper output signal during operation

Roll-form design assures that the preload adjustment, which is set by the manufacturing process, guarantees constant bearing clearance. This protects the hub assembly from over-torquing during installation.

By using Z3, G10 grade roller bearings, and using a computer controlled machining and grinding process, precise precision components are created, which guarantees the lowest vibration tolerances.

## NON ROLL-FORM UNIT

Bearing preload adjustment can be affected by over torquing of axle nut

Bearing retained on spindle by pressed on sleeve

Bearing inner ring can rotate with bearing creating noise issue

### CHEMICAL ELEMENT COMPOSITION OF THE RAW MATERIAL

#### SAE-1055:

Symbol	C	Si	Mn	S	P	Cr	Ni	Cu
%	0.62 ~ 0.7	0.17 ~ 0.37	0.9 ~ 1.2	≤0.035	≤0.035	≤0.25	≤0.3	≤0.25

#### Gcr15:

Symbol	C	Si	Mn	S	P	Cr	Mo	Ni	Cu	Ni+Cu
%	0.95 ~ 1.05	0.15 ~ 0.35	0.2 ~ 0.4	≤0.020	≤0.027	1.30 ~ 1.65	≤0.10	≤0.3	≤0.25	≤0.50

### MECHANICAL PROPERTY OF THE RAW MATERIAL

#### SAE-1055:

Symbol	$\sigma_b$	$\sigma_s$	$\delta_5$	$\psi$
Data	≥645 Mpa	≥380 Mpa	≥13 %	≥35 %

#### Gcr15:

Item	Tensile Strength	Yield Strength	Elongation of Rupture	Flexural Strength
Data	861.3 Mpa	518.42 Mpa	27.95 %	1821.61 Mpa

# CRS Hub Bearings

CRS OE Quality Hub Bearings are manufactured in a joint partnership with an OEM Manufacturer to provide our customers with a quality and dependable Hub bearing assembly.

